

NEW SPECIES OF *RHYACOPHILA* FROM VIRGINIA
(INSECTA: TRICHOPTERA: RHYACOPHILIDAE)

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ABSTRACT

A new species of rhyacophilid caddisfly from Virginia, *Rhyacophila tricornuta* is described and figured. This new species is related to *R. nigrita*, but differs from all other known species of *R. nigrita* subgroup mainly by the shape of the dorsoapical section of Segment IX bearing three short and rounded lobes.

INTRODUCTION

The genus *Rhyacophila* is widely distributed throughout the holarctic region. The Nearctic region supports rich and diverse populations of *Rhyacophila* that are included in several indigenous groups and complexes. One-hundred-twenty-six species were reported from North America including Greenland and Mexico (Morse, 1993). The *R. invaria* group includes 14 species all restricted to the eastern United States. Larvae in this group inhabit small, cold rivers and streams in the Appalachian region. According to Schmid (1970) within this group two subgroups could be easily distinguished, the *R. invaria* subgroup and the *R. nigrita* subgroup. Until now the *R. nigrita* subgroup included six closely related species that could be identified based on male genitalia characterized by transverse and high-crested abdominal Segment X, absence of horizontally produced lateral winglets on anal sclerites, and notched dorsoapical margin of Segment IX. In collections from Smyth County, Virginia, a new species of *Rhyacophila* in the *R. nigrita* subgroup has been recently discovered, and is described in this paper.

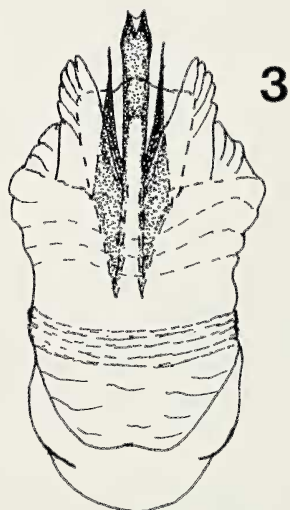
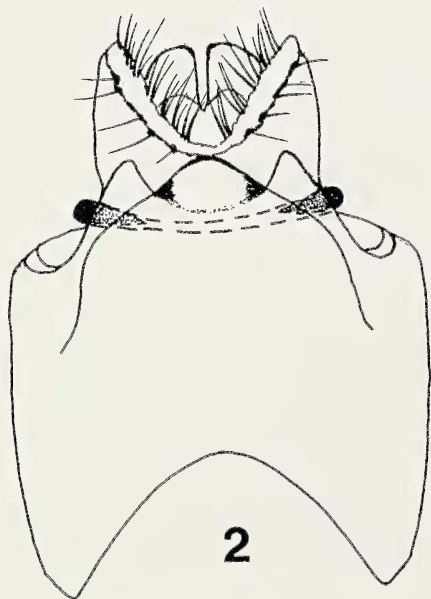
SYSTEMATIC ENTOMOLOGY

Rhyacophila tricornuta, **new species**
(Fig. 1-3)

Diagnosis.—This species is characterized by its male genitalia. The unique features separating this species from other American *Rhyacophila* are three dorsoapical, rounded lobes on Segment IX and a dark, rounded process extended into an “undulated” apicolateral section located at the base of the anal sclerites.

Description.—Male: length 12 mm. General appearance of specimen in alcohol brown. Head, thorax, and antennae black; legs yellowish; abdomen brown with darker terminal Segments VII, VIII, and IX. Ventromesal projection on Segment VII very short and smaller than in *R. nigrita*, corresponding in size to ventral

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Submitted 19 April 1995.



“dent” found on Segment VI in the latter species. Wing venation and general structure typical for genus.

Male genitalia: Segment IX annular, narrow ventrally, wide dorsal section with double emargination forming lateral notch producing pair of dorsolateral lobes and very short, rounded dorsoapical process not reaching base of Segment X. Segment X with emarginated dorsoapical section resulting in V-shaped, triangular notch; from lateral view forming high-crested, rounded lobes covered with short bristles. Base of Segment X narrow with heavily sclerotized small, dark lateral lobes extending dorsoapically into an “undulated,” dark brown sclerite. Anal sclerites similar to those of *R. nigrita* with rounded apices from lateral and dorsal views. Inferior appendages each with basal segment as broad as long, apical segment bilobed; tapered ventral lobe bearing narrow band of conspicuous dark spicules on dorsoapical margin; the ventral lobe 2.5 times as long as apically rounded dorsal lobe.

Phallic apparatus large, mostly membranous, and similar to that of *R. nigrita*; the spiniform parameres straight and long; aedeagus sinuous, sclerotized and up-turned at apex.

Female: unknown.

Type Specimen.—Holotype, male, Virginia: Smyth Co., Mount Rodgers National Recreation Area, Hurricane Campground next to Hurricane Creek, May 22, 1994, Declan J. McCabe. The holotype is deposited at the Carnegie Museum of Natural History.

Etymology.—Latin, meaning “three horns.”

DISCUSSION

Rhyacophila tricornuta is a member of the *R. invaria* group and closely related to species included in the *R. nigrita* subgroup. This is based on similarity of several morphological features but especially on the shape of Segment X with transverse high crest and inferior appendages similar to those in *R. nigrita* and *R. acutiloba* (Schmid, 1970; Morse and Ross, 1971). However, the characteristic which separates this new species from all members of the *R. nigrita* group is the shape of the dorsoapical margin of Segment IX which in the *R. invaria* subgroup is extended into a single, solid or more-or-less forked dorsomesal lobe. In six species of the *R. nigrita* subgroup the dorsoapical margin of Segment IX is notched posteriorly in the center with no distinct lobes or projections. It is also of interest that the ventromesal projection on Segment VII is extremely short in *R. tricornuta* (30 μm). In males of *R. nigrita* the same process is usually over 60 μm in length while the rudimentary ventromesal projection on Segment VI is approximately 20 μm long. This process is missing on Segment VI of *R. tricornuta*.

These morphological characteristics, especially the three-lobed Segment IX, set *R. tricornuta* apart from any other known species in the *R. invaria* group. However, in order to define the placement of this species within *R. nigrita* subgroup, additional information on female morphology and possibly on immature stages is needed.

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Fig. 1–3.—Male genitalia of *Rhyacophila tricornuta*, n. sp. 1, left lateral view; 2, dorsal view; 3, phallic apparatus, ventral view.

A single specimen of *R. tricornuta* was captured in a black-light trap near the confluence of two second-order streams—an unnamed tributary and Hurricane Creek. Hurricane Creek flows east in the valley formed between Hurricane Mountain and Bear Ridge while the unnamed creek flows west in the valley formed between Hurricane Mountain and Bobbys Ridge. The two combine at 36°42'45"N 81°42'45"W, and the resulting third order stream is called Comers Creek which flows north between Bobbys Ridge and Bear Ridge. The confluence is at elevation 852 m (2795 ft) in the Iron Mountains. The trap was operated continuously from shortly before nightfall until midnight. Additional Trichoptera species collected in the light trap included *Goera fuscula* Banks, *Glossosoma nigrior* Banks, and *Dolophilodes distinctus* (Walker). The following caddisfly larvae were collected by hand from the creeks in the sampling area: *Rhyacophila carolina* Banks, *R. fuscula* Banks, *Agapetus* sp., *Neophylax* sp., *Dolophilodes distinctus* (Walker), and *Pycnopsyche luculenta* Betten. The streams in the area also supported a diverse population of stoneflies, mayflies, and blepharicerid flies including species of *Acroneuria*, *Peltoperla*, *Isoperla*, *Ephemerella*, *Epeorus*, and *Blepharicera*.

Based on this information the larvae of this new species inhabit second-order streams or seepage areas at higher elevations of the Appalachians in Virginia.

ACKNOWLEDGMENTS

We are grateful to Dr. John S. Weaver III for reviewing the figures.

LITERATURE CITED

- MORSE, J. C. 1993. A checklist of the Trichoptera of North America including Greenland and Mexico. Transactions of the American Entomological Society, 119:4–93.
- MORSE, J. C., AND H. H. ROSS. 1971. Two new species of *Rhyacophila* from eastern North America. Journal of the Kansas Entomological Society, 44:403–405.
- SCHMID, F. 1970. Le genre *Rhyacophila* et la famille des Rhyacophilidae (Trichoptera). Mémoires de la Société Entomologique du Canada, 60:1–230.